

NON-PUBLIC?: N
ACCESSION #: 8904050121
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Fermi 2 PAGE: 1 OF 4

DOCKET NUMBER: 05000341

TITLE: Turbine Trip/Reactor Scram Due to Design Deficiency in Turbine
Overspeed Reset

EVENT DATE: 02/26/89 LER #: 89-006-00 REPORT DATE: 03/28/89

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: Patricia Anthony, Compliance Engineer TELEPHONE: (313) 586-1617

COMPONENT FAILURE DESCRIPTION:

CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE TO NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On February 26, 1989, a turbine trip and reactor scram occurred during operation of a reset pushbutton for the main turbine mechanical overspeed test. The operator had not received the expected indication at one point in the test and wanted to verify that the logic was reset. When the reset pushbutton was depressed a second time, a turbine trip occurred followed by a reactor scrams.

The cause of the turbine trip was a poor design of the main turbine overspeed trip linkage, as recognized by the manufacturer. Additionally, the lack of knowledge of the consequences of using this reset pushbutton out of sequence contributed to the event.

The training department has incorporated a discussion of the linkage operation into the turbine controls lecture. The operator has been counselled. Also, a critique of this event is being given in licensed operator training. An evaluation of the necessity for a design change to improve the human factors considerations of this reset will be performed.

END OF ABSTRACT

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Initial Conditions:

Operational Condition: 1 (Power Operation)
Reactor Power: 99.8 Percent
Reactor Temperature: 535 degrees Fahrenheit
Reactor Pressure: 1000 Psig

Description of Event:

On February 26, 1989 at 0230 hours, during the performance of 27.112.03, "Turbine Generator Mechanical Overspeed Test", the Nuclear Supervising Operator (NSO) failed to receive the expected indication when he reset the overspeed test equipment (TA)(12)!. He stopped the test and informed the Nuclear Assistant Shift Supervisor (NASS) that the "RESET NO. 2 OVERSPEED" pushbutton backlight (IL) had failed to illuminate. The NASS explained that this had occurred in the past, the condition was being addressed and tracked in the Limiting Condition for Operation Log (LCO entry 88-0609) and that the NSO should proceed with the test. The NSO completed the test with subsequent indications as expected. Upon completion of the test at 0242 hours, the NSO wanted to ensure the overspeed trip logic was reset, so he again depressed the "RESET NO. 2 OVERSPEED" pushbutton. The NSO was unaware that use of the reset mechanism out of sequence could result in a turbine trip.

When the pushbutton was depressed, the number 2 turbine mechanical overspeed trip relay (RLY) was energized and turbine trip occurred. A reactor scram (JC) was generated, as designed, by the turbine control valve (XCV) fast closure. The immediate actions for turbine trip and reactor scram were carried out in accordance with the post scram procedure and the scram was reset at 0244 hours.

Evaluation of the plant's response has been performed. A reactor vessel low water level condition (Level 3) occurred as part of this event; therefore valve groups 4, 13 and 15 isolated per design. Water level was returned to normal without initiation of any Emergency Core Cooling Systems.

Cause of Event:

The turbine trip was caused by a poor design of the mechanical overspeed trip linkage by the manufacturer. When the reset pushbutton is depressed following an actuation of the overspeed

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trip linkage, oil from the main lube oil system (LL) is ported to a reset piston. When the reset piston is actuated, the linkage moves around two pivot points to allow the trip lever to relatch. With the trip lever relatched, depressing the reset pushbutton still ports oil to the reset piston; however, the trip lever provides an additional pivot point and forces the linkage to move in the trip direction. There is sufficient movement to actuate the turbine trip snaplock switch. Therefore, by depressing the reset pushbutton after completion of the test, a turbine trip was generated rather than verifying that the trip was reset.

A contributing factor to this event was the use of the reset mechanism out of sequence by the operator (licensed utility). He did not have sufficient knowledge of the potential consequences of his actions. This feature of the overspeed trip linkage, i.e.s operation when in the latched (reset) condition was not previously known by the turbine manufacturer's (English Electric's) on-site representative, the system engineer, the training department or the licensed operators. The lack of information provided by the manufacturer on this unusual design feature is a major contributing factor to this event.

Analysis of Event:

The equipment and components actuated during this event performed per their design. The subsequent scram of the reactor and plant shutdown was according to design. Therefore, this event did not result in a condition which could endanger the health and safety of the public or plant personnel.

Corrective Action

The nuclear training organization has incorporated the operation of the main turbine overspeed trip linkage for both the latched and unlatched condition into the main turbine controls lecture. Training for licensed personnel on this subject will be completed by May 1, 1989. The operator involved in this event was counselled in accordance with company policy. A critique of this event, including the lessons learned, will be reviewed with licensed operations personnel as part of cycle 3 training which is scheduled to be completed May 26, 1989.

In addition, the Technical Engineering Department will evaluate the need for a change in the design of the mechanical overspeed trip linkage. This evaluation will be completed by July 31, 1989.

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Previous Similar Occurrences:

There have been no previous similar occurrences. This was the first time that this pushbutton had been operated without the trip circuit being defeated in accordance with approved procedures.

ATTACHMENT 1 TO 8904050121 PAGE 1 OF 1

William S. Orser
Vice President 10CFR50.73
Nuclear Operations

Detroit Fermi 2
Edison 6400 North Dixie Highway
Newport, Michigan 48166 Nuclear
(313) 586-5300 March 28, 1989 Operations
NRC-89-0058

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Reference: Fermi 2
NRC Docket No. 50-341
Facility Operating License No. NPF-43

Subject: Licensee Event Report (LER) No. 89-006-00

Please find enclosed LER No. 89-006-00, dated March 28, 1989, for a reportable event that occurred on February 26, 1989. A copy of this LER is also being sent to the Regional Administrator, USNRC Region III.

If you have any questions, please contact Patricia Anthony at (313) 586-1617.

Sincerely,

Enclosure: NRC Forms 366, 366A

cc: A. B. Davis
J. R. Eckert
R. C. Knop
W. G. Rogers
J. F. Stang

Wayne County Emergency
Management Division

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